

PATENT
P56559PCTFolio: P56559PCT
Date: 5/25/05
I.D.: REB/kf**IN THE CLAIMS**

Please amend claims 1, 11 and 19 as follows:

1 1. (Currently Amended) A closed injection moulded closure, comprising:
2 a first closure part;
3 a second closure part; and
4 two connecting elements connected to the first closure part and the second closure part
5 by two pairs of hinge connections, each said pair of hinge connections having a first hinge
6 connection and a second hinge connection, each said first hinge connection connecting upper
7 sides of said connecting elements to said first closure part, each said second hinge connection
8 connecting bottom sides of said connecting elements to said second closure part, each said pair
9 of hinge connections making a first angle (ϕ) with one another and defining a plane, [[the]]
10 planes defined by said two pairs of hinge connections making a second angle (ω) with one
11 another, wherein, in a closed position of the closure, each said plane is inclined relative to a
12 central closure axis, and the two connecting elements and the two pairs of hinge connections
13 are accessible in the mould from the inside of the closure and from the outside of the closure
14 and can be removed from the mould;
15 said closed injection moulded closure being free from a main hinge connection between
16 said first closure part and said second closure part.

PATENT
P56559PCT

1 2. (Previously Presented) The closed injection moulded closure according to claim
2 1, further comprised of the first and the second closure parts, in the closed position of the
3 closure, functionally separated from one another by at least one gap.

1 3. (Previously Presented) The closed injection moulded closure according to claim
2 1, further comprised of the first and the second closure parts, in the closed position of the
3 closure, connected by at least one coupling element which is destroyed or removed when the
4 closure is opened for the first time.

1 4. (Previously Presented) The closed injection moulded closure according to claim
2 3, wherein said coupling element is a web or a tear-off lip.

5. (Cancelled)

1 6. (Previously Presented) The closed injection moulded closure according to claim
2 1, further comprised of the connecting elements in an opened position having no geometric
3 deformations relative to an injection moulded state.

1 7. (Previously Presented) The closed injection moulded closure according to claim
2 1, wherein an opening angle (α) between the first closure part and the second closure part in an
3 open position of the closure is 150° to 180°.

PATENT
P56559PCT

1 8. (Previously Presented) The closed injection moulded closure according to claim
2 1, wherein the relationship among an opening angle (α) between the first closure part and the
3 second closure part in an open position of the closure, the first angle (ω) and the second angle
4 (ϕ) is given by the following formula:

$$\phi = 2 \cdot \arctan \left[\frac{\sin(\alpha / 2)}{1 - \cos(\alpha / 2)} \cdot \sin(\omega / 2) \right].$$

1 9. (Previously Presented) The closed injection moulded closure according to claim
2 1, further comprised of the connecting elements being integrated into outer contours of the first
3 and the second closure parts.

1 10. (Previously Presented) The closed injection moulded closure according to claim
2 1, wherein the first closure part is adjacent to the second closure part and the first and the
3 second closure parts are actively connected to a container, at least one closure part being
4 detachably and actively connected to the container.

1 11. (Currently Amended) ~~[[The]]~~ A closed injection moulded closure according to
2 ~~claim 1, comprising:~~
3 a first closure part;
4 a second closure part; and

PATENT
P56559PCT

5 two connecting elements connected to the first closure part and the second closure part
6 by two pairs of hinge connections, each said pair of hinge connections having a first hinge
7 connection and a second hinge connection, each said first hinge connection connecting upper
8 sides of said connecting elements to said first closure part, each said second hinge connection
9 connecting bottom sides of said connecting elements to said second closure part, each said hinge
10 connections making a first angle (ϕ) with one another, and defining two planes making a second
11 angle (ω) with one another, wherein, in a closed position of the closure, each of said planes is
12 inclined relative to a central closure axis and the two connecting elements and the two pairs of
13 hinge connections are accessible in the mould from the inside of the closure and from the
14 outside of the closure and can be removed from the mould;

15 each of said connecting elements having a shorter edge and a longer edge, said shorter
16 edge being closer to an apex of said first angle (ϕ) than said longer edge and being pressure-
17 resistant, said longer edge lengthening elastically and reversibly under a tensile stress; and

18 said closed injection moulded closure being free from a main hinge connection between
19 said first closure part and said second closure part.

1 12. (Previously Presented) The closed injection moulded closure according to claim
2 11, further comprised of said longer edge being of a three-dimensional curvature.

1 13. (Previously Presented) The closed injection moulded closure according to claim
2 1, further comprised of said two pairs of hinge connections being film hinge connections.

PATENT
P56559PCT

1 14. (Previously Presented) The closed injection moulded closure according to claim
2 1, further comprised of said first closure part having at least two stable positions including at
3 least one open position and the closed position.

1 15. (Previously Presented) The closed injection moulded closure according to claim
2 1, wherein said first closure part has an open position, the closed position and at least one
3 intermediate open position

1 16. (Previously Presented) The closed injection moulded closure according to claim
2 3, further comprised of said coupling element having a predetermined breaking point.

1 17. (Previously Presented) The closed injection moulded closure according to claim
2 1, said two connecting elements connected to each other by means of a film hinge connection.

1 18. (Previously Presented) The closed injection moulded closure according to claim 1,
2 further comprised of said first closure part having a tubular element on an inner side of said first
3 closure part, said tubular element corresponding to an opening of the container, said tubular
4 element sealing the opening of the container, said tubular element having an edge thickened by
5 a bead.

PATENT
P56559PCT

1 19. (Currently Amended) ~~[[The]]~~ A closed injection moulded closure according to
2 ~~claim 1~~, further comprising:

3 a first closure part;

4 a second closure part;

5 means for partially stiffening the first and the second closure parts; and

6 two connecting elements connected to the first closure part and the second closure part
7 by two pairs of hinge connections, each said pair of hinge connections having a first hinge
8 connection and a second hinge connection, each said first hinge connection connecting upper
9 sides of said connecting elements to said first closure part, each said second hinge connection
10 connecting bottom sides of said connecting elements to said second closure part, each said hinge
11 connections making a first angle (ϕ) with one another, and defining two planes making a second
12 angle (ω) with one another, wherein, in a closed position of the closure, each of said planes is
13 inclined relative to a central closure axis and the two connecting elements and the two pairs of
14 hinge connections are accessible in the mould from the inside of the closure and from the
15 outside of the closure and can be removed from the mould, said closed injection moulded
16 closure being free from a main hinge connection between said first closure part and said second
17 closure part.

1 20. (Previously Presented) The closed injection moulded closure according to claim
2 1, further comprised of said first closure part having a catch for preventing unintentional
3 opening of the closure.

PATENT
P56559PCT

1 21. (Previously Presented) A closure for a container, comprising:
2 a first closure part;
3 a second closure part to be placed on the container, said first closure part opening and
4 closing the container by moving relative to said second closure part;
5 at least two connecting elements connecting said first closure part and said second
6 closure part, each said connecting element having a first side separated from a second side, by
7 an intermediate third side spaced-apart from an intermediate fourth side, said fourth side being
8 longer than said third side; and
9 two pairs of hinge connections, each said pair of hinge connections comprising a first
10 hinge connection and a second hinge connection, said first side of each said connecting element
11 connected to said first closure part via said first hinge connection, said second side of each said
12 connecting element connected to said second closure part via said second hinge connection,
13 wherein in a closed position of the closure each said first hinge connection is closer to an axis
14 of closure than are said second hinge connection, with said first closure part assuming at least
15 two stable positions and assuming unstable positions between said at least two stable positions
16 and with the two connecting elements and the two pairs of hinge connections being accessible
17 in a mould from the inside of the closure and from the outside of the closure and being
18 removable from the mould;
19 said closure being free from a main hinge connection between said first closure part and
20 said second closure part.

PATENT
P56559PCT

1 22. (Previously Presented) The closure of claim 21, comprised of said two connecting
2 elements and the two pairs of hinge connections being accessible in the mould from the inside
3 of the closure and from the outside of the closure.

1 23. (Previously Presented) The closure of claim 21, wherein said third sides of said
2 connecting elements are pressure-resistant.

1 24. (Previously Presented) The closure of claim 21, wherein, in a closed position of
2 the closure, each said connecting element has a curved outer contour.

1 25. (Previously Presented) The closure of claim 21, wherein said at least two
2 connecting elements are integrated into an outer contour of the closure.

1 26. (Previously Presented) The closure of claim 21, wherein, in a closed position of
2 the closure, said two connecting elements and said two pairs of hinge connections are in
3 approximately stress-free states.

1 27. (Previously Presented) The closure of claim 21, wherein torsional rigidities of said
2 third sides are higher than torsional rigidities of said fourth sides.

PATENT
P56559PCT

1 28. (Previously Presented) The closure of claim 21, comprising a coupling element
2 coupling the first closure part and the second closure part, said coupling element being
3 destroyed when the first closure part is separated from said second closure part for the first time.

1 29. (Previously Presented) The closure of claim 21, comprising an auxiliary
2 connection between said two connecting elements.

1 30. (Previously Presented) The closure of claim 21, wherein said second closure part
2 has a tubular element on an inner side of said second closure part, said tubular element has an
3 edge thickened by a bead, and said tubular element has a shape corresponding to an opening of
4 the container to act as a seal when in a closed position.

5 31. (Previously Presented) The closure of claim 21, further comprising means for
6 partially stiffening the first and the second closure parts.

1 32. (Previously Presented) The closure of claim 21, further comprising a catch for
2 preventing unintentional opening of the closure.

1 33. (Previously Presented) The closure of claim 21, wherein an opening angle between
2 the first closure part and the second closure part in an open position of the closure is 150° to
3 180°.

PATENT
P56559PCT

1 34. (Previously Presented) The closure of claim 21, wherein a relationship among an
2 opening angle (α), a first angle (ϕ) and a second angle (ω) is given by the following formula:

3
$$\phi = 2 \cdot \arctan \left[\frac{\sin(\alpha / 2)}{1 - \cos(\alpha / 2)} \cdot \sin(\omega / 2) \right]$$

4 where said opening angle (α) is an angle between the first closure part and the second
5 closure part in an open position of the closure;

6 said first angle (ϕ) is defined by said first and said second hinge connections of each said
7 pair of hinge connections; and

8 said second angle (ω) is an angle made by two planes, each of said two planes defined
9 by each said pair of hinge connections.

1 35. (Withdrawn) A closed injection moulded process, comprising:
2 simultaneously moulding in a closed position, an entirety of a closure comprised of a
3 first closure part mated in a closed position against a second closure part, and two connecting
4 elements spaced-apart by an intermediate gap, connected to the first closure part and the second
5 closure part by two pairs of hinge connections, each said pair of hinge connections having a first
6 hinge connection and a second hinge connection, each said first hinge connection joining upper
7 sides of said connecting elements to said first closure part, each said second hinge connection
8 joining bottom sides of said connecting elements to said second closure part, each said pair of

PATENT
P56559PCT

9 hinge connections making a first angle (ϕ) with one another and defining a plane, the planes
10 defined by said two pairs of hinge connections making a second angle (ω) with one another,
11 wherein, in the closed position of the closure, each said plane is inclined relative to a central
12 closure axis, with the two connecting elements and the two pairs of hinge connections being
13 accessible in the mould from the inside of the closure and from the outside of the closure; and
14 removing the closure from the mould.

1 36. (Withdrawn) The process of claim 35, comprised of forming an opening angle
2 between the first closure part and the second closure part to occur between approximately 150°
3 to 180° while said first closure part is displaced from said closed position to an open position
4 of the closure.

1 37. (Withdrawn) The process of claim 35, wherein a relationship among an opening
2 angle (α), said first angle (ϕ) and said second angle (ω) is given by a formula of:

3

$$\phi = 2 \cdot \arctan \left[\frac{\sin(\alpha / 2)}{1 - \cos(\alpha / 2)} \cdot \sin(\omega / 2) \right]$$

4 where said opening angle (α) is an angle between the first closure part and the second
5 closure part while said first closure part is rotatably displaced from said closed position to an
6 open position of the closure.

PATENT
P56559PCT

1 38. (Previously Presented) A closure for a container, comprising:
2 a lower closure part oriented to engage an opened end of the container;
3 an upper closure part disposed to assume at least two spatially defined and stable
4 positions relative to said lower closure part; and
5 two connecting elements spaced-apart by an intermediate gap, joining said lower closure
6 part and said upper part by two pairs of hinge connections, each said pair of hinge connections
7 having a first hinge connection and a second hinge connection, each said first hinge connection
8 joining upper sides of said connecting elements to said upper closure part, each said second
9 hinge connection joining bottom sides of said connecting elements to said lower part, with a
10 first angle (ϕ) occurring between said first and said second hinge connections of each said pair
11 of hinge connections and each of said pair of hinge connections defining a plane with a second
12 angle (ω) occurring between each said plane, with each said plane being inclined relative to a
13 closure axis of said closure, the two connecting elements and the two pairs of hinge connections
14 being accessible in a mould from the inside of the closure and from the outside of the closure
15 and being removable from the mould;
16 said closure being free from a main hinge connection between said first closure part and
17 said second closure part.

1 39. (Previously Presented) The closure of claim 38, comprised of said upper closure
2 part forming an opening angle with said lower closure part between approximately 150° to 180°
3 while said upper closure part is displaced from a closed position mating with said lower closure

PATENT
P56559PCT

part, to an open position of the closure.

40. (Previously Presented) The closure of claim 38, wherein a relationship among an opening angle (α), said first angle (ϕ) and said second angle (ω) is given by a formula of:

$$\phi = 2 \cdot \arctan \left[\frac{\sin(\alpha / 2)}{1 - \cos(\alpha / 2)} \cdot \sin(\omega / 2) \right]$$

where said opening angle (α) is an angle between the first closure part and the second closure part while said first closure part is rotatably displaced from said closed position to an open position of the closure.

41. (Previously Presented) A closure for a container, comprising:
a lower closure part oriented to engage an open end of the container;
an upper closure part disposed to mate with said lower closure part, along a peripheral junction that forms a demarcation between said lower closure part and said upper closure part when said closure is in a closed position of said closure, and joined to said lower closure part by at least one frangible element traversing said peripheral junction while said closure maintains a virginity of said closed position; and
two connecting elements spaced-apart by an intermediate gap movably joining said lower closure part and said upper part by two pairs of hinge connections, each said pair of hinge connections having a first hinge connection and a second hinge connection, each said first hinge

PATENT
P56559PCT

11 connection joining upper sides of said connecting elements to said upper closure part, each said
12 second hinge connection joining bottom sides of said connecting elements to said lower part,
13 with a first angle (ϕ) occurring between said first and said second hinge connections of each
14 said pair of hinge connections and each of said pair of hinge connections defining a plane with
15 a second angle (ω) occurring between each said plane, with each said plane being inclined
16 relative to a central closure axis of said closure, and the two connecting elements and the two
17 pairs of hinge connections being accessible in a mould from the inside of the closure and from
18 the outside of the closure, with the closure being removable from the mould.

1 42. (Previously Presented) The closure of claim 41, comprised of an opening angle
2 formed between the first closure part and the second closure part to extend between
3 approximately 150° to 180° while said first closure part is displaced from said closed position
4 to an open position of the closure.

1 43. (Previously Presented) The closure of claim 41, with said closure providing a
2 relationship among an opening angle (α), said first angle (ϕ) and said second angle (ω) given
3 by a formula of:

$$\phi = 2 \cdot \arctan \left[\frac{\sin(\alpha / 2)}{1 - \cos(\alpha / 2)} \cdot \sin(\omega / 2) \right]$$

5 where said opening angle (α) is an angle between the first closure part and the second

PATENT
P56559PCT

closure part while said first closure part is rotatably displaced from said closed position to an open position of the closure.

44. (Withdrawn) A closed injection moulded process, comprising:

simultaneously moulding in a closed position, an entirety of a closure comprised of a first closure part mated in a closed position against a second closure part along a peripheral junction that forms a demarcation between said lower closure part and said upper closure part, and joined to said lower closure part by at least one frangible element traversing said peripheral junction while said closure maintains a virginity of said closed position; and

two connecting elements spaced-apart by an intermediate gap, connected to the first closure part and the second closure part by two pairs of hinge connections, each said pair of hinge connections having a first hinge connection and a second hinge connection, each said first hinge connection joining upper sides of said connecting elements to said first closure part, each said second hinge connection joining bottom sides of said connecting elements to said second closure part, each said pair of hinge connections making a first angle (ϕ) with one another, and defining a plane, the planes defined by said two pairs of hinge connections making a second angle (ω) with one another, wherein, in the closed position of the closure, the planes are inclined relative to a closure axis, with the two connecting elements and the two pairs of hinge connections being accessible in the mould from the inside of the closure and from the outside of the closure; and

removing the closure from the mould.

PATENT
P58559PCT

1 45. (Withdrawn) The process of claim 44, comprised of forming an opening angle
2 between the first closure part and the second closure part to occur between approximately 150°
3 to 180° while said first closure part is displaced from said closed position to an open position
4 of the closure.

1 46. (Withdrawn) The process of claim 44, wherein a relationship among an opening
2 angle (α), said first angle (ϕ) and said second angle (ω) is given by a formula of:

3
$$\phi = 2 \cdot \arctan \left[\frac{\sin(\alpha / 2)}{1 - \cos(\alpha / 2)} \cdot \sin(\omega / 2) \right]$$

4 where said opening angle (α) is an angle between the first closure part and the second
5 closure part while said first closure part is rotatably displaced from said closed position to an
6 open position of the closure.